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TABLE OF CONTENTS

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ORIGINAL ARTICLES

Typhoid Fever Cases in Three Hospital Centers of the American Expeditionary Forces, France. *By William H. Robey, M.D.*, Boston. 161
A Report of the Harvard Infantile Paralysis Commission on the Diagnosis of Acute Cases in 1920, with Special Reference to the Incidence of Cases without Paralysis. *By Francis W. Peabody, M.D.*, Boston. 174
Significant Reactions of the Arterial Tension. Manifestations of the Angio-Kinetic Energy, Clinically Observed and Interpreted. *By Claës Julius Enebuske*, Boston. 176

CURRENT LITERATURE

Wassermann Test with Secretions, Transudates, and Exudates in Syphilis. 181
The Danger of Pituitary Extract. 181

EDITORIALS

The Surgeon's Fee. 182
The Truth about Vivisection. 182
Cancer Work. 183
Medical Notes. 184

OBITUARIES

James Munroe Fay, M.D. 186
Florence Hale Abbot, M.D. 186

MISCELLANY

Artificial Limbs Work at Roehampton, 1915-1921. 186
The New England Surgical Society. 187

CORRESPONDENCE

The Avaricious Medical Student. *David Howard Gibson, M.D.* 188

Original Articles.

TYPHOID FEVER CASES IN THREE HOSPITAL CENTERS OF THE AMERICAN EXPEDITIONARY FORCES, FRANCE.

By William H. Robey, M.D., Boston,

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While this paper was being written, the excellent statistical report of Major V. C. Vaughan, Jr., appeared. Major Vaughan and I studied together clinically about one fourth of the cases in this report while he was Chief of Medical Service at Chaumont. He left early in January, 1919 to gather the material for his report. The 79 cases given in this paper were seen by the writer many times in the hospital centers visited in the routine of duty.

Dr. Vaughan has given statistics showing the number of times cultures were made in the 331 cases in his series and cases were not classed as proved typhoid or paratyphoid unless the cultures were positive. An inspection of our tables might raise the just criticism that we have included cases in which the cultures were negative although several were taken in each instance but a diagnosis of typhoid was made in some culture negative cases upon such data as onset, course, temperature and pulse curves, undoubted rose spots, spleen and bronchitis. On the other hand, a number of cases showed little clinically upon which to make a diagnosis of typhoid and the disease was not suspected until a positive culture was obtained or the lesions were found at autopsy. Case 2 was clinically and bacteriologically phthisis but the bacillus typhosus was recovered from the blood. Case 17 was supposed to be a broncho-pneumonia until the autoposy proved the diagnosis. Cases 20 and 25 had negative cultures although a positive diagnosis was made clinically the correctness of which was shown at autopsy. Case 35 died 4 hours after admission. He was very ill with what appeared to be acute lobar pneumonia but the autopsy showed broncho-pneumonia and typhoid.

Chaumont

Case No.	Age	Organization	Vaccination	Onset	Clinical Manifestations & Physical Examinations
1	24	307 Inf.	July 1918	Gradual, with headache, cough, diarrhea and mod. abdominal pain	Abd. distention mod. severely prostrated, palpable spleen, no spots
2	29	305 Inf.	Dec. 1917	Gradual with cough, pain in chest and general malaise	Signs almost entirely respiratory, lesion in left upper lobe. Suggests pul. tub. clinically. B. tuberculosis in sputum
3	23	305 Inf.	June 1918	Loss of appetite, cough, diarrhea, general lassitude	Marked rose eruption and spleen, nervous symptoms prominent features.
4	31	307 Inf.	July 1918	Gradual with headache, general asthenia, cough and diarrhea	No positive localizing signs, general weakness & apathy, some diarrhea
5	23	305 Inf.	May 1918	Rather sudden with chills, headache and diarrhea	Rose spots & spleen; not very sick generally, good appetite throughout
6	25	307 Inf.	July 1918	Rather sudden with headache, vomiting, giddiness and diarrhea	Rather mild case, general apathy & slight diarrhea, no spleen nor spots
7	28	308 Inf.	July 1918	Gradual with headache, backache and pains in leg	Not very ill, tem. curve quite typical but not high. Palpable spleen and several crops of spots
8	22	306 Inf.	July 1918	Gradual with general lassitude, diarrhea and huskiness of voice	Characteristic typhoid curve, general apathy, suggestive spots, & easily palpable spleen.
9	22	307 Inf.	July 1918	Rather sudden with headache, chills and some diarrhea	Low muttering delirium most pronounced feature. Marked distention & spots. Pulse dicrotic.

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Case No.	Age	Organization	Vaccination	Onset	Clinical Manifestations & Physical Examinations
10	23	307 Inf.	Feb. 1918	Been having diarrhea intermittently for several weeks	No clinical symptoms in way of febrile reaction or general malaise
11	24	305 Inf.	Feb. 1918	Gradual with diarrhea and general malaise	Moderately sick. Suggestive rose spots. Spleen barely palpable
12	25	302 Supply Train	Dec. 1917	Gradual with intermittent constipation and diarrhea, general lassitude & loss of appetite	Very mild case. No spleen nor spots, fairly large patch of pneumonic consolidation at end of 4th week with negative symptoms except pleuritic pain.
13	26	307 Inf.	Feb. 1918	Gradual with diarrhea, loss of appetite & general lassitude	Marked spleen & rose spots, Some broncho-pneumonic patches at right base.
14	23	Adv. Ord. Depot #4	May 1918	General lassitude, slight cough & intermittent diarrhea	Temperature & general aspect of typhoid; marked rose spots, but no spleen.
15	25	306 M.G.Bn	Feb. 1918	Gradual with pain in back & legs. Mild rigors & slight cough	Fever, general apathy, quite marked abdominal distention, dicrotic pulse, No spleen nor spots.
16	32	305 Inf.	Feb. 1918	Gradual with headache, then cough & pain in chest.	Mod. distention, few scattered spots suggestive of typhoid. Temperature curve much like that of typhoid.

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	Laboratory Findings	Widal	Probable Source	Date Admitted	Complications	Autopsy	Remarks
1	W.B.C.5400 P.58% Cul. Neg.	Agglutination B.typhosus 1:640	Argonne				Mild case. Typhoid appearance
2	W.B.C.8700 P.90% B.typhosus in blood	Neg.	"				Tuberculosis gives many more signs than typhoid
3	W.B.C.8100 P.75% B.typhosus in blood	Neg.	"				Typical clinically proved by laboratory
4	W.B.C.4600 P.44% Cul. Neg.	B.paratyphosus 1:360	"				In all probability a typhoid. No definite findings.
5	W.B.C.11600 P.64% P.typhosus isolated from blood	Neg.	"				
6	W.B.C.4800 P.69% Cul. Neg.	Neg.	"				Questionable typhoid.
7	W.B.C.16300 P.76% Cul. Neg.	B.paratyphosus B 1:2560	"				Resembles "para" from the agglutination
8	W.B.C.6200 P.66% Cul.&Stool neg.	B.typhosus. Agglutinates1:640	"				Clinically marked case of typhoid
9	W.B.C.10000 P.68% Culture Neg.	Not reported	"				Clinically marked typhoid.

Chaumont

	Laboratory Findings	Widal	Probable Source	Date Admitted	Complications	Autopsy	Remarks
10	B.typhosus isolated from stools		Argonne				Came to hospital with surgical condition in shoulder joint. Reported as a carrier.
11	W.B.C.12000 P.76% Culture Neg.	B.paratyphosus B. agglutinates 1:1280	"				Probable "para". Clinically typhoid.
12	W.B.C.9600 P.82% B.typhosus in blood. No agglutination		"				Doing well
13	W.B.C.3000 P.70% Culture Neg. No agglutination		"				One of the most marked clinical typhoids in the epidemic
14	W.B.C.7800 P.74% Culture Neg.		"				One other suspicious case from his outfit now in hospital. French civilian from that area here with typhoid in summer.
15	W.B.C.9000 P.92% Cul. & stool negative	B.typhosus 1:640	"				Doubtless a typhoid.
16	W.B.C.9000 P.78% Culture Neg.	Neg.	"				This case rather doubtful at present examination.

Case No.	Age	Organization	Vaccination	Onset	Clinical Manifestations & Physical Examinations
17	27	306 Inf.	Unknown patient delirious since admission	About 3½ weeks ago	Broncho-pneumonia, delirium, irregular weak heart, extreme cyanosis, distention, spleen
18	32	307 Inf.	Aug. 1918 Only two injections	25 days ago	Spleen and rose spots, bronchitis, dicrotic pulse
19	24	Sgt. Adv. Ord. Depot #4	July 1917	Little over two weeks ago	No definitely localized signs.
20	28	307 Inf.	Unknown	Probably four weeks ago.	Spleen and rose spots. Signs of pneumonia. Delirium and failing circulation.
21	29	307 Inf.	Jan. 1918	About three weeks ago with diarrhea.	Distention spleen
22	25	307 Inf.	July 1918	Four weeks with diarrhea.	General typhoid look, dry tongue, fever, slow pulse, emaciation, spleen.
23		Cook 128th Inf.	Jan. 1918	Three weeks ill, vomiting and diarrhea	Spots & spleen, suppurative parotitis.

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Case No.	Age	Organization	Vaccination	Onset	Clinical Manifestations & Physical Examinations.
24	27	305 M.G.Bn.	July 1918	Came in hospital with epidemic menengitis. Typhoid developed during convalescence here. Onset with headache and rise of temperature.	General typhoid aspect, Several crops of rose spots Large spleen
25	28	307 Inf.	Unknown	Probably about three weeks ago. Diarrhea.	General typhoid aspect, rose spots & spleen. Considerable distention.
26	?	307 Inf.	Unknown (Delirious)	Three and one-half weeks ago with diarrhea.	Coated tongue, delirious, slight abdominal distention, spleen, relatively slow pulse.
27	32	Cpl. 307 Inf.	Sept. 1917	Eleven days ill	Dry tongue, apathy, relatively slow pulse, distention, spleen, no rose spots
28	28	307 Inf.	July 1917		Rose spots & spleen. Many bronchial rales, abdominal distention.
29	25	Cpl. 314 Inf.	Sept. 1918	Gradual with general malaise three weeks ago.	Macular eruption suggestive of roseola of typhoid. Spleen, bronchitis of larger tubes, moderate distention.
30	25	305 Inf.	Aug. 1918	Two weeks ago, headache, pains in legs, diarrhea.	Bronchitis, spleen, fever, general typhoid aspect.

	Laboratory Findings	Widal	Probable Source	Date Admitted	Complications	Autopsy	Remarks
17	W.B.C.18000 P.80% Other findings negative.		Argonne		Bronchopneumonia	Patchy pneumonia,. splenic tumor, mesenteric adenitis, typhoid ulcers, catarrhal colitis	Died December 17th *
18	W.B.C. 5800 P.56% B. typhosus in blood	1:1200	"				Definite case. Doing well.
19	W.B.C.5200 P.72% Culture Negative	B.typhosus 1.50 B. paratyphosus A.1.50 B.1:100	"				Isolated as a suspect.
20	W.B.C. ? Culture Negative	Negative	"			Typhoid ulcers, patchy pneumonia, splenic tumor, caseous mesenteric glands.	Died December 17th *
21	W.B.C.7200 P.58% Culture Negative	Not done	"				Temperature, pulse and other general features strongly suggest typhoid, Recovered.
22	W.B.C.13000 P.74% Culture Neg		"				Whole picture points to typhoid. Recovery
23	W.B.C.8200 P.68% Culture Negative	Agglutinates B typhosus in high dilutions	"				Interesting typhoid complication.

	Laboratory Findings	Widal	Probable Source	Date Admitted	Complications	Autopsy	Remarks
24	W.B.C.9000 P.76% Culture Negative		Argonne				Definite clinical case.
25	W.B.C.6200 P.76% Culture Negative	Neg.	"			Ulcers in colon. Large hemorrhage in rt. frontal lobe of brain.	Moderately severe 3d week, clinical typhoid. Died January 3d *
26	W.B.C.5000 P.72% Positive B.typhosus culture	Para B 1:100	"			Lobar pneumonia	Seemed clinically definite enteric fever. Organisms may be Para - "B" Died 5th week *
27	W.B.C.11400 P.82% B.typhosus in blood Agglutinates 1:1200		"				Clinically typhoid. Later, doubtless a typhoid. Has four day recrudesence after being normal a week
28	W.B.C.8000 P.66% No agglutination nor culture. Tb. in sputum		"				Eruption looks like a typhoid roseola. Recovery. X-ray of chest neg. No signs now. In all probability a typhoid.
29	W.B.C.7500 P.83% Other findings neg.		"				Not much positive data. Resembles typhoid. This case not from epidemic area.
30	W.B.C.10000 P.80% Bld.Culture B.typhosus						Case proven by laboratory findings. Recovery.

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Case No.	Age	Organization	Vaccination	Onset	Clinical Manifestations & Physical Examinations
31	23	307 Inf.	Sept. 1917	Ten days ago with diarrhea.	Nothing definite localizing. Relatively slow pulse.
32	25	Cpl. 305 Inf.	July 1918	Five days ago	Negative
33	?	Cpl. 308 Inf.	July 1918	Two weeks ago with diarrhea.	Spleen and rose spots. General typhoid aspect.
34	25	Cpl. 508 Eng.	Not recorded	Three weeks ago	
35	?	307 Inf.	Not recorded	Three and one-half weeks ago with diarrhea.	Signs and diagnosis of lobar pneumonia. Typhoid not suspected.
36	26	307 Inf.	July 1918	Three weeks ago with general malaise.	Distended abdomen, fever, spleen and rose spots.
37	25	307 Inf.	Aug. 1918	?	Nervous symptoms have been outstanding feature, admitted as a psychopath. Has cleared quite completely with the hydrotherapy.
38	27	321 Inf.	July 1918	ten-eleven days ago.	Spleen, slight bronchitis, constipation, doughy, tympanitic abdomen.

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Case No.	Age	Organization	Vaccination	Onset	Clinical Manifestations & Physical Examinations.
39	25	307 Inf.	? Delirious	Three weeks ago with bronchitis.	Spleen, rose spots, distended abdomen, bronchitis.
40	24	307 Inf.	October 1917	Ten days ago. General malaise.	No definite findings
41	21	307 Inf.	August 1918	Ten days ago with diarrhea.	No definite localizing symptoms.
42	26	305 Inf.	February 1918	Gradual with rigors (mild) headache and cough.	General typhoid aspect, abdominal distention, few rose spots, palpable spleen
43	27	308 Inf.	? Delirious	Good history from patient cannot be obtained.	Marked lethargy & slowing of mentality, temperature curve rather like that of typhoid. Tubercular meningitis suspected. Lumbar puncture negative.
44	25	306 Inf.	July 1918	Gradual with headache, diarrhea and general myalgia.	Marked prostration, abdominal distention. Many bronchial rales. Numerous crops of rose spots. No spleen.
45	32	308 Inf.	July 1918	Gradual with diarrhea, general malaise and huskiness of voice.	Marked prostration with abdominal distention a pronounced feature. General aspect clearly that of typhoid. No rose spots, no spleen. Very sick.
46	25	307 Inf.	Feb. & Nov. 1918	Moderate diarrhea, extending over six weeks. General lassitude & cough marked of late.	Very mild clinically. Slight distention, large spleen. Suggestive rose spots.
47	30	305 Inf.	July 1918	Rather sudden with chill and cough.	Signs at first entirely respiratory, then continuous headache and slight diarrhea. Later, very profuse rose spots. No Spleen.

	Laboratory Findings	Widal	Probable Source	Date Admitted	Complications	Autopsy	Remarks
31	W.B.C.9700 P.76% Culture Negative	Neg.	Argonne				Developed thrombophlebitis of left fermoral vein in fifth week.
32	W.B.C.20400 P.89% Culture Positive	Neg.	"				Sent from surgical side having flat foot. Ten days later developed present condition
33	W.B.C.5400 P.60% Culture B. typhosus	None	"				Probable typhoid.
34			"			Typhoid enteritis & colitis, acute splenic tumor, cholecystitis, cloudy swelling of parenchymatus organs	Died December 14tn, shortly after admission. *
35			"			Broncho-pneumonia acute splenic tumor,. cloudy swelling of parenchymatous organs. Acute enteritis of typhoid character.	Died December 13th, four hours after admission. *
36	W.B.C.8900 P.84% Culture Negative	Neg.	"				Probable typhoid.
37	W.B.C.4800 P.68% Culture strep.viridans.		"				Looks much like typhoid. Slight hemorrhage at beginning of third week. Recovery.
38	W.B.C.9400 P.84% Cul. once negative	Once Neg.	"				Clinically typhoid. Recovery.

	Laboratory Findings	Widal	Probable Source	Date Admitted	Complications	Autopsy	Remarks
39	W.B.C.7800 Culture Positive		Argonne				Distinctly clinical typhoid. Died Pneumonia-left lower Typhoid ulcers. *
40	W.B.C.7900 P.60% Culture Negative	Negative	"				Considered suspicious. Clinically a typhoid. Considerable bronchitis. Recovery.
41	W.B.C.5800 P.56% Cul. Neg.		"				Questionable typhoid. good recovery.
42	W.B.C.8500 P.72% Cul. Neg.	Not reported	"				Unmistakably a clinical case.
43	W.B.C.16000 P.60% Culture Negative	Negative	"				Doubtful case. Somewhat improved under the baths.
44	W.B.C.14900 P.66% Culture B.typhosus	Negative	"				Sharp typhoid. Chest signs a marked feature.
45	W.B.C.8000 P.78% Culture Negative	B.typhosus 1:320	"				Doubtless typhoid.
46	W.B.C.10100 P.50% Cul.B.paratyphosus"A"	Negative	"				Second "para" in the group.
47	W.B.C.11800 P.84% Cul.B.paratyphosus"A" Agglutination 1:10480		"				Positive "para"

B.H.58

Case No.	Age	Organization	Vaccination	Onset	Clinical Manifestations & Physical Examinations
48		1st Lt. 123 F. A.	June 1917 March 1918	Nov. 6, 1918, Headache, diarrhea.	Headache, cough, alternating diarrhea and constipation, rose spots, palpable spleen, dicrotic pulse.
49		1st Lt. 123 F. A.	July 1917 September 1917	November 7, 1918, Malaise, Headache, Epistaxis	Headache, apathy, abdominal distention, constipation, rose spots, dicrotic pulse, spleen not palpable.
50		123 F. A.	Oct. 1917 Six inoc.	Nov. 20, 1918, Diarrhea, Malaise	Diarrhea, apathy, typhoid facies dry tongue, rose spots, palpable spleen, dicrotic pulse.
51		123 F. A.	July 1917 Sept.1917	Nov. 27, 1918 Chill, Headache, Diarrhea	Headache, stiff neck suspicious Kernig on admission (spinal puncture negative). Dry tongue, tympanites, rose spots, palpable spleen.
52		302 Inf.	May 1918	Nov. 11, 1918, Cold and tired, Headache, Epistaxis	Prostration, headache, typhoid facies, tympanites, rose spots, spleen not palpable.
53		330 F.A.	June 1918	November 22, 1918 Weakness and slight rise in temperature	Clinically influenza on 11/20/18 up and around on 11/20/18 but weak, fever rose to 100.2 11/29-prostration tympanites. Hemorrhage 12/3/18
54		First Gas Regiment	Dec. 1917	Oct. 1, 1918. Diarrhea(while in Argonne)	10/15-clinically influenza-cough and mucopurulent expectoration. On10/28 temperature began to rise - constant abdominal pain. No rose spots, spleen palpable.
55		315 Inf.	June 1918	Oct. 3, 1918. Abdominal pain and diarrhea while coming out of Argonne.	Diarrhea, tympanites, abdominal pain and tenderness right iliac fossa, rose spots and dicrotic pulse, spleen not palpable, dry tongue.
56		Hosp. Corps B.H. 58	April 1918	Nov. 5, 1918	Clinically bronchitis with patch of consolidation and normal temperature 28 days followed by gradual rise with A.M. remission. Rose spots, palpable spleen, dry tongue tympanites, slow pulse.

B. H. 58 & B. H. No. 88

B.H.
No. 88

Case No.	Age	Organization	Vaccination	Onset	Clinical Manifestations & Physical Examinations.
57		119 F.A.	?	November 22, 1918 Malaise and cough	Onset 11/22 with chilliness, cough & high fever. Admitted to B.H.58-11/27 diagnosed as bronchitis and influenza. Patient desperately ill with marked tympanites, rose spots excessive cough and expectoration. Right lower lobe dull, many rales and rough breathing both lower lobes.
58	8	French Civilian	None	December 3, 1918	High fever, tympanites, enlarged spleen.
59	22	16 F.A.			Clinical picture of typhoid in third week. Entered walking, tem. 104.
60	25	319 F.A.			Clinically typhoid
61	30	315 Inf.	Two vaccine injections July 1918. Fourteen day intervals.	About 11/8/18 on Verdun Front.	Typhoid
62	32	26 Inf.	One injection vaccine July 1918	About 11/10/18 St. Mihiel Sector.	Clinically Paratyphoid
63	26	304 F.A.	Three injections mixed vaccine, 5 day intervals Feb. 1918	Nov. 24, 1918	
64	26	305 F.A.	Three injections, six day intervals October 1918	Nov. 20, 1918, near Somonth, France.	Clinically paratyphoid

	Laboratory Findings	Widal	Probable Source	Date Admitted	Complications	Autopsy	Remarks
48	W.B.C.4000 Bld.Cul.Pos. Stool Neg. Urine Neg.		Argonne Front	11/25/18 from command			Typhoid
49	W.B.C.5200 Bld. Cul. Pos.		"	11/25/18 from command			Typhoid
50	W.B.C.5800 Bld. Cul. positive		"	12/4/18 from command			Typhoid
51	W.B.C.5000 Bld. Cul. positive		"	11/30/18 from command			Typhoid
52	W.B.C.6000 Bld. Cul. positive Urine Neg.		Enroute to Rimaucourt (had been travelling in France).	11/17/18 from command			Typhoid
53	W.B.C.12900 W.B.C.14000 Bld. Cul. Positive		Infected in ward?	11/5/18 from command	Hemorrhage 3 pts. 12/3/18		Para Typhoid Beta 12/20/18
54	W.B.C.5900 Bld. Cul. Positive		Infected in ward?	11/11/18 from B.H. 59			Typhoid
55	W.B.C.5800 Bld. Cul. Negative Stool neg. Urine neg.		Argonne Front	10/12/18			Typhoid
56	W.B.C.4700 Bld. Cul. Negative Stool Neg. Stool pos. 12/10/18		IN B.H.58 or Rimaucourt?	9/23/18 from command			Typhoid

	Laboratory Findings	Widal	Probable Source	Date Admitted	Complications	Autopsy	Remarks
57	W.B.C.7500 Bld. Cul. Negative Post mortem Bld.& bile cultures Positive.			11/27/18	Hemorrhage Lobar Pneumonia	Typhoid ulcers in lower ileum perforation 3mm in diameter 60 cm of ileocecal valve. Lobar pneumonia rt. lower, upper and part of middle lobe. Typhoid bacilli;recovered post mortem.	12/5/18 had hemorrhage and lost 1½qts. of blood. Died that night *
58	Bld. Cul. Positive		Rimaucourt	12/8/18			Typhoid
59	Organism isolated from feces 10/20/18		Unobtainable Sent from Verdun Front				Died 10/23/18 *
60	Pos. paratyphoid feces 12/8/18		Unknown from Verdun Sector	B.H. 88 11/29/18			Recovery
61	Bld. Cul. Neg.11/30/'18. Feces positive 12/8/18		Unknown				Recovery
62	Bacillus paratyphosus, feces 12/9/18 Bld. Neg.						Recovery
63	Paratyphosus feces 12/2/18 B.cul.neg. 12/9/18		Unknown	12/2/18			Recovery
64	Paratyphoid Bacillus Feces 12/11/18		Drinking water said to be bad in this neighborhood. Simeilar sickness there.	12/2/18			Recovery

B.H.No.88

Case No.	Age	Organization	Vaccination	Onset	Clinical Manifestations & Physical Examinations.
65	24	65 CAV	Three injections of vaccine,. 5 -day intervals, August, 1917	Nov. 17, 1918, Sevencourt, France	
66	28	316 INF		Unobtainable	Clinically Typhoid
67	25	54 Pion Inf.	Three injections of vaccine	Nov. 24, 1918 Kruse, France	Clinically Typhoid
68	33	354 Inf.	Three injections of vaccine. May 1918	Nov. 18, 1918 Argonne	
69	21	AAP 1st Army	Three injections. Dates unknown	Unknown	Clinically Typhoid
70	23	308 Inf.	Unknown	Unknown	Clinically Typhoid
71	26	52 Inf.			Clinically paratyphoid
72	27	6 FS BN			Paratyphoid
73	22	308 Inf.			Paratyphoid 11/16/18
74	29	104 Inf.			Paratyphoid 12/16/18 Suspect, Unconfirmed by laboratory
75		Sgt. 127 Inf.			Paratyphoid Nov. 16, 1918

B.H.No.88

Case No.	Age	Organization	Vaccination	Onset	Clinical Manifestations & Physical Examinations.
76	27	6 Eng.			Clinically paratyphoid
77	26	353 Inf.			Paratyphoid
78	27	321 F A	Three injections of vaccine, 9 day intervals Sept. 1917		Clinically typhoid
79	26	E H 9			Clinically typhoid

	Laboratory Findings	Widal	Probable Source	Date Admitted	Compli-cations	Autopsy	Remarks
65	Bld. Neg. 11/30/18 Feces pos. Paratyphosus 12/4/18		Unknown	11/25/18			Recovery
66	Bacillus typhosus from blood culture 12/3/18		Unknown	11/29/18			Patient Polish, unable to speak English
67	Bacillus paratyphosus feces 12/12/18		Unknown	11/29/18			Recovery
68	Bacillus paratyphosus, feces 12/15/18		City Water	11/29/18			Recovery
69	Bacillus paratyphosus 12/8 1918		Unknown	11/29/18			Recovery
70	Bacillus typhosus feces 12/5/18		Unknown	11/29/18			Recovery
71	Bacillus paratyphosus, feces 12/5/18			11/29/18 from E.H.11			Recovery
72				11/25/18 from E H 6			Recovery
73				11/4/18 from E H 9			Recovery
74				12/15/18 From F H 103			Recovery
75	Organism isolated in stool 11/15/18			11/5/18 from E H 7			Recovery

	Laboratory Findings	Widal	Probable Source	Date Admitted	Compli-cations	Autopsy	Remarks
76	Organism in stool 11/15/18			11/4/18 from E H 9			Recovery
77				11/29/18 from E H 6			Recovery
78	Bacillus Typhosus Blood cul. 12/24/18		Date unknown. Drinking water from ditch near Verdun Front	12/20/18			Recovery
79	Bacillus Typhosus in feces 12/26/18		Date unknown. Been caring for typhoid patients at E H 9. Probable direct infection.				Recovery

* Deaths

VACCINATION

We assumed that every case in our group was vaccinated since all soldiers upon leaving for France were supposed to receive three inoculations of mixed vaccines. Vaughan says in his report that "nearly all soldiers leaving for France" received preventive typhoid inoculations raising a doubt that all received them. The service cards of patients admitted to the various hospitals were not available so we were forced to rely upon the patients' statements. A patient was always questioned when the condition at entrance permitted and the reply was usually that he had received "three shots" in the arm at some station. Where the date of vaccination is given in the table it means that the soldier had made a satisfactory statement. In 22 instances the record was unobtainable or unsatisfactory. Some of these men by accident may not have received any inoculations or of those 55 who apparently received three, one or even two of the inoculations may have been ineffective through faulty technique. It has been shown that immunity increases with increasing numbers of inoculations. The routine practice of giving three inoculations of the same dosage to each man gave us a uniform basis upon which to test the efficacy of the vaccine. Take for example the 47 typhoids from the 77th Division. Thirty-eight gave a satisfactory history of three inoculations and one of two inoculations. Of the 8 whose vaccinations were unrecorded, 7 died but all were in a serious condition at entrance, too sick to give an account of themselves. They had been ill between three and four weeks. The physical condition of the men of the 77th Division was practically the same. All had been subjected to the same hardships and therefore if the soldiers had not been protected by our vaccine we would have had hundreds of cases instead of 47. This also confutes the argument of a new type of organism or one of unusual virulence. This particular division lived for several weeks in an infected area in the Argonne. The Germans had defecated in shell holes and in spite of the efforts of medical and company officers some of the men could not be prevented from drinking the stagnant water. It is interesting, however, to note that in the entire group of 78 soldiers there were only 2 lieutenants, 2 sergeants and 5 corporals, the remaining 69 soldiers being privates. One of the 69 was a hospital corps man who probably contracted typhoid in one of the base hospitals where there were 10 other cases. This fact goes to show that the infection was water borne and not food, and occurred principally in privates who did not heed instructions. Dunham (*Amer. Jour. Med. Sci.*, Vol. CLVII, No. 5) reports a severe case occurring in a careless orderly who had been vaccinated three times within three months and felt that he could handle typhoid excreta without risk although constantly warned of his danger. In Base Hospital 58 and 88, the cases were isolated ones representing several different organizations. It may be that some of the men did not receive a sufficient dosage or a vaccine of satisfactory antigenic properties but the very small number of cases in the 77th Division and the scattering ones from other organizations demonstrate the efficiency of the vaccine used in our army. A glance at the table will show that the time limit on vaccination was about the same in all cases. In some where the interval was longest, the course was milder.

The *Journal of the American Medical Association* has recently published (March 6, 1920) an article on typhoid fever in the United States for 1919. The report shows a steady decrease in typhoid mortality in most of the large cities. While sanitary and health departments have been steadily increasing in efficiency, an editorial in the same number of the Journal commenting on these factors and the further advantage that it has now become possible for health authorities to investigate promptly and thoroughly each case of typhoid as soon as it appears thus making it constantly easier to check incipient epidemics, to discover typhoid carriers and to exercise better control over the surroundings of each case, also makes the following important additional statement:

"It should not escape notice that the 1919 rate shows a proportionately large diminution. The most plausible explanation would seem to be that given in our special article namely, that the antityphoid inoculation of the young men in the military camps has proved a continuing safeguard for this age group, which would ordinarily have furnished a considerable number of typhoid victims. It seems to be evident that water supply and milk supply are hardly important factors at present in typhoid causation in our large American cities."

Colonel Russell in his artical in the *A. M. A. Journal* gives statistical tables showing that antityphoid vaccination has reduced the rate, not only below the rates of previous wars but also below the rate found in civil life in some of the older states where the entire population is protected by all the sanitary measures of modern life. In comparing the number of cases of typhoid fever in the Spanish War with those of the World War the difference is striking.

Every sanitary measure possible should be carried out but until vaccination is universal, typhoid will not entirely disappear. No one but a soldier in the stress and heat of battle would knowingly drink infected water. Even a properly vaccinated man in civil life could not run the risk of taking infected food or water but our experience with a whole division shows how good the chances of escape are for the vaccinated.

With the strong evidence of the value of antityphoid vaccination under the poorer sanitary conditions of war, how many civilian doctors are urging or even suggesting vaccination in the communities where they practice? The vaccinated young men who were protected during the war and who have helped so materially to reduce the typhoid rate for 1919 will shortly be unprotected and the rate will rise unless we take steps to revaccinate them. If the public could become thoroughly acquainted with the value and simplicity of antityphoid vaccination it would be generally adopted—certainly it is our duty to educate the people.

Onset.

The onset in most of the cases was similar to unvaccinated patients. They were ill from ten days to three weeks before entering the hospital. It will be noted that diarrhoea was the rule. It is difficult to draw deductions from this symptom as diarrhoea was almost universal among the soldiers of the American Expeditionary Forces. The majority of officers with whom I talked had had it at some time. Recurrences were frequent.

Dr. Vaughan in his paper discusses the question of mild typhoid and diarrhoea. As he says there may have been hundreds and thousands of these cases but there is no evidence to prove it. Laboratory studies of diarrhoea were chaotic and indeterminate. Certainly with the first appearance of typhoid in the various centers, a thorough bacteriological search was made in every gastrointestinal and undetermined fever case. Many were ruled out. It is probable that there were many mild cases in the camp from which the majority of these patients came since only about one half reached the base hospital.

Course.

The course in the majority of cases was clinically typhoid and was proved by laboratory findings. Six of the patients had pneumonia and all died. One entered with a well marked lobar pneumonia and died in three hours without typhoid being suspected. Many of these patients remained in camp until the onset of some complication or until the typhoid symptoms were so fully declared that a clinical diagnosis was evident. The early cases orignated in the Argonne in many instances while the later ones were probably infected by healthy or convalescent carriers. As soon as a case remotely suggesting typhoid was admitted, blood cultures were made and failure of diagnosis was followed by an examination of the stools. Every case of unexplained fever, diarrhoea or digestive disturbance was tested for typhoid. The cases of typhoid without complications received reasonably early ran the usual course with good recoveries.

Blood and Stool Cultures.

In 25 of the 79 cases the blood culture was positive for typhoid or one of the two paratyphoids while the stools of the 17 were positive making a total of 42 cases proved clinically as typhoid. In the 35 remaining cases the diagnosis was made on the clinical appearances. Of the 9 fatal cases, 6 had negative laboratory findings, 3 of the 6 being in the hospital too short a time for study. The 3 remaining cases were clinically typhoid with positive laboratory and autopsy findings. In 53 cases in which white counts were obtained the average count was 8,564.

Treatment.

The treatment pursued was the same as in civil hospitals in recent years. Most of the cases were fairly well advanced when admitted to the base hospital so that any form of treatment other than purely symptomatic would have been impracticable. As far as possible the patients were fed on a caloric basis.

Conclusions.

The value of antityphoid vaccination is beyond question.

The need of making antityphoid vaccination universal should be impressed upon physicians who should instruct the public.

Major Vaughan quotes two Italian army surgeons who believe that antityphoid vaccination results in a milder course and this may be so if Vaughan's supposition that many of the unclassified diarrheas may have been actually unrecognized cases of ambulatory typhoid but this point remains unproved. Certainly we were unable to observe any modification in the course of our cases. While it was thought that the general symptomatic picture was sometimes obscured, there were in most cases sufficient findings to substantiate the diagnosis. The writer cannot conclude that if these patients were efficiently vaccinated their general picture differed materially from the numerous cases he has seen in civil practice during the time when typhoid was much more common.

Those who are interested in the statistics of the cases occurring in the American Expeditionary Forces should consult the excellent report of Major V. C. Vaughan, Jr., Medical Corps, U. S. Army, in the *Journal of the American Medical Association.*

I desire to express my thanks to Major D. A. Haller, Captain Frank P. Strom and Lieut. Ralph Hurd for much of the data contained in this report.

A REPORT OF THE HARVARD INFANTILE PARALYSIS COMMISSION ON THE DIAGNOSIS OF ACUTE CASES IN 1920, WITH SPECIAL REFERENCE TO THE INCIDENCE OF CASES WITHOUT PARALYSIS.

By Francis W. Peabody, M.D., Boston.

In August, 1920, cases of epidemic poliomyelitis began to appear in Eastern Massachusetts in unusual numbers, and the Harvard Infantile Paralysis Commission was requested by the Commissioners of Health of the State of Massachusetts and of the City of Boston to coöperate with them in the diagnosis of early cases, as it had done in the epidemic of 1916. Four physicians were appointed, whose duty it was to visit suspected cases at the request of the physicians in charge of the patients and to attempt to make a diagnosis from the history, physical signs, and examination of the spinal fluid. The diagnosticians who carried out this work were Dr. D. A. Hassman, Dr. S. A. Levine, Dr. A. B. Lyon and Dr. W. A. Sisson. The epidemic proved to be a small one and only 133 cases were visited. Fifty-one of these were found not to have poliomyelitis. This group was comprised of a great variety of conditions and includes children who apparently had no definite disease. In 75 cases a diagnosis of acute poliomyelitis was definitely made and in seven cases the same diagnosis was tentatively made but not confirmed, either on account of absence of characteristic paralysis or lack of permission to perform lumbar puncture. Lumbar puncture was performed in 54 cases. It was usually not done if the child was paralyzed so that the diagnosis of poliomyelitis was clear, or if other physical signs indicated directly the nature of the disease. Under other circumstances lumbar puncture was advocated on the ground that it makes possible the early recognition of cases which may be capable of transmitting the disease, that it leads to their receiving better care from the onset, and that the diagnosis in an abortive case which never develops paralysis carries with it an assurance of immunity in the future. In nineteen cases in which the final diagnosis, based on the clinical findings and examination of the spinal fluid, was of some condition other than acute poliomyelitis, the cell count of the spinal fluid was twelve or less per c. m.m. in eighteen cases and 114 per c. m.m. in one case. In the latter patient the Wassermann reaction on the spinal fluid was positive and a diagnosis of syphilitic meningitis was made. The spinal fluid was examined in fifteen cases in which paralysis was already present and the clinical diagnosis was acute poliomyelitis. In eleven cases the cell count varied between fourteen and 153 per c. m.m., and in four it was twelve or less per c. m.m.

Special interest is attached to the cases seen first in the preparalytic stage of the disease. There is general agreement among authorities that epidemic poliomyelitis usually manifests itself first as an acute general infection in which symptoms develop suggesting involvement of the meninges. Stiffness of the neck, with resistance and pain on flexion, is one of the earliest and most characteristic signs. There is nothing pathognomonic about the clinical picture before the onset of paralysis, but there is much that is suggestive so that during an epidemic the diagnosis is often suspected and later confirmed by the development of typical palsies. In the preparalytic stage the most helpful diagnostic method is lumbar puncture, for experience has shown that in a large proportion of cases there is an increase of the cells in the spinal fluid. Draper[1] has demonstrated that in the earliest phase of the disease in certain cases, the spinal fluid may be normal and the increase in spinal fluid cell count may only develop after several days, but without the pleocytosis it is difficult or impossible to make a definite diagnosis of acute poliomyelitis in the preparalytic stage. If the diagnosis is made on the clinical picture together with an increased cell count in the spinal fluid, and if certain other conditions known to cause similar changes in the spinal fluid can be excluded, the probability of its being correct is great. When an epidemic of poliomylitis is in progress the error of diagnosis based on the clinical picture and spinal fluid examination would undoubtedly be very small. As far as is known, there is very little accurate information available with regard to the number of persons who become infected with poliomyelitis during an epidemic and who never develop paralysis. The importance of obtaining accurate knowledge concerning this phase of the disease is quite obvious, for it has a bearing on possible unrecognized sources of spread and is essential as a guide to the result of therapy. In the epidemic of 1916, the diagnosis of poliomyelitis was often made in the preparalytic stage, but as treatment by intraspinous injection of serum was usually administered it was not possible to obtain any data as to the natural course of the disease. A review of the therapeutic results reported since 1916 left the Harvard Infantile Paralysis Commission unconvinced as to the demonstrated value of any method of treatment thus far suggested, and they decided in 1920 that they would not make any representations with regard to specific treatment in the acute stage. The Commission offered the services of its representatives simply as diagnosticians. This gave an opportunity for the collection of data regarding the natural course of the disease and the frequency of the development of paralysis. Fortunately the epidemic was comparatively mild. As a result of this, however, the public and the profession were less alert than in 1916 and for both reasons the number of early cases seen was small. There are, indeed, only thirteen cases in which the clinical picture, the pleocytosis in the spinal fluid, and the subsequent history of the case, justify the diagnosis of acute poliomyelitis in the preparalytic stage. The details are recorded in Table I.

TABLE I.

Case No.	Day of Illness	Spinal Fluid Cell Count Per C. MM.	Remarks
2	2(?)	125	Died two days later of respiratory paralysis
6	5	47	Died the same day
8	5	123	No paralysis developed
16	4	239	No paralysis developed
20	7	292	No paralysis developed
22	6	41	No paralysis developed
43	2	209	Developed paralysis of left arm and partial paralysis of right arm
52	3	49	No paralysis developed
70	2	170	Developed slight paralysis of toes of both feet
80	2	22	No paralysis developed
87	3	65	No paralysis developed
91	2	46	No paralysis developed
128	3	44	No paralysis developed

Case No. 8 is included in this group in spite of there being a question of slight paralysis of one side of the soft palate. Case No. 80 is regarded as having had poliomyelitis in spite of a comparatively low cell count because he showed a typical clinical picture and because a younger brother developed the disease three days later and died with involvement of the muscles of respiration after an illness of about 48 hours. Case No. 91 was unable to void urine for two days and had numbness in arms and legs but did not become definitely paralyzed.

An analysis of this group of cases shows, therefore, that of the thirteen under consideration only four, or 31 per cent., became definitely paralyzed, while nine, or 69 per cent., did not develop any paralysis. A similar group of untreated cases is reported by Draper (page 90) and of the thirty patients concerning whom the outcome is stated, nineteen, or 63 per cent., escaped paralysis. Both of these sets of figures are too small to be of great significance, but they represent a type of information which should be diligently collected whenever the opportunity arises. In all probability the incidence of paralysis in patients infected with acute poliomyelitis varies in different epidemics, at different periods in the same epidemic, and among different groups or ages at the same period in an epidemic. The facts regarding this aspect of the disease should be sought with the utmost care, for it is only when they have been obtained that we shall have adequate evidence with which to control entirely the efficacy of therapeutic measures which are designed to prevent the occurrence of paralysis. It is of interest in this connection to review some of the therapeutic results which were obtained by various observers who used specific methods of treatment in the epidemic of 1916. The Harvard Infantile Paralysis Commission[2] treated fifty-one cases in the preparalytic stage by intravenous injection of the serum of patients who had recovered from the disease, and thirty-five, or 69 per cent., recovered without paralysis. Draper (page 91) treated forty-six cases in the same stage with a similar serum, and reported twenty, or 43 per cent., escaped paralysis. Amoss and Chesney[3] used intraspinous and intravenous and subcutaneous injections of serum of recovered cases in fourteen patients, and in ten, or 71 per cent., no paralysis developed. Zingher[4] used the same type of serum intraspinally in fifty-four cases in the preparalytic stage and in forty-four, or 82 per cent., no paralysis occurred. Twenty-five of this group were seen in the Willard Parker Hospital, and twenty-four, or 96 per cent., of these did not become paralyzed. On the other hand, nine out of ten cases treated by Zingher by intraspinous injection of normal serum also failed to develop paralysis. Rosenow[5] prepared a serum by the inoculation of horses with a streptococcus isolated by him from human cases of poliomyelitis, and administered it intravenously in the treatment of patients in an epidemic at Davenport, Iowa, in 1917. Sixteen cases in the preparalytic stage were treated and in none of them did paralysis develop. Considering the fact that the evidence at hand indicates that about 65 per cent. of patients infected by acute poliomyelitis never develop paralysis even if untreated, the results of these small series of cases cannot be regarded as carrying great weight. In a disease in which a favorable outcome is apparently more commonly the rule than the exception, it is particularly important to be extremely critical with regard to therapeutic measures. The most valuable criterion of the efficacy of treatment is a real understanding of the natural course of the disease, and it is hoped that the attempt made in this report to further our knowledge in this direction may stimulate others who come in contact with larger groups of cases to seek the same type of information.

REFERENCES.

[1] Draper: Acute Poliomyelitis. Philadelphia, 1917.
[2] Peabody: Boston Medical and Surgical Journal, 1917, clxxvi, 687.
[3] Amoss and Chesney: Jour. Exp. Med., 1917, xxv, 580.
[4] Zingher: Jour. A. M. A., 1917, lxviii, 817.
[5] Rosenow: Jour. Infect. Dis., 1918, xxii, 379.

SIGNIFICANT REACTIONS OF THE ARTERIAL TENSION. MANIFESTATIONS OF THE ANGIO-KINETIC ENERGY, CLINICALLY OBSERVED AND INTERPRETED.[*]

By Claës Julius Enebuske, Boston.

Third Part.

XI. BIOCHEMIC ANGIO-KINETIC TOXAEMIA-REACTION.

The author's biochemic angio-kinetic toxaemia-reaction is developed from observations of intimately correlated chemical facts and biological phenomena, the salient points of which will be summed up and discussed in the following paragraphs.

Section I. Fundamental Facts.

1. In cases belonging to the psychoneurological groups of morbidity in which the radialis maximum tension is hypertonic, *i.e.*, at a basic level of 160-320 m.m., Hg., or hypotonic, *i.e.*, at a basic level lesser than 140 m.m. Hg.—herein not included instances complicated with hemorrhage, shock, or collapse, nor cases diagnosed as cardio-pathic, nor conditions produced by continuous pressure of neoplasms or foreign bodies upon neuronic elements—such anomaly, whether hypertension or hypotension, is reduced to the normal tension, at a level exceeding 140 m.m., not exceeding 150 m.m. Hg. by the action of iodine, under the following conditions.

A. If the iodine is carried into the circulating blood by a molecular complex possessing predominant connection with colloidal protein, forming a precipitate instantly on contact with it, which precipitate is easily dissolved, when there is a surplus of colloidal protein;

B. If the molecular complex employed is capable of permeating living animal membranes and carrying all the iodine contained in it through such membranes without injury to them, *i.e.*, provided that the destructive property (caustic action) of iodine is excluded from the complex;

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[*] Continued from Boston Medical and Surgical Journal, April 21, 1921; July 28, 1921; August 4, 1921.

C. If the iodine-carrying complex does not contain iodine in the state of free iodine, and if the complex is capable of taking up nitrate of silver in an amount equivalent to ninetenths of the iodine contained in it, forming a perfectly clear and transparent water solution in which even after twenty-four hours there is no deposit of iodide of silver, nor clouding of the solution, and if it reacts upon peroxide of hydrogen and guaiac, as stated in Section III, 6.

D. If the iodine-carrying complex is obtained through interaction of and in the presence of iodine, glycerine and tannin, without the presence of water; and if it is obtained as a completely soluble product without deposition of any insoluble by-product arisen through the oxidation of tannin; and if it retains its dynamic and chemical properties without deposition of any insoluble precipitate even after prolonged preservation.

E. If the reagent is used in strict accord with the technique formulated by the author (cnfr. Boston Medical and Surgical Journal, Vol. clxxx, No. 11) and, in consequence, the iodine introduced into the blood connects with or acts primarily upon protein or other organic property of the blood or in tissue-elements.

2. The above statements are founded upon direct observation by the author in 250 cases of various diseases (all chronic), more than one hundred belonging to the psychoneurological groups of morbidity and about 100 cases of pulmonary tuberculosis. The age of the subjects observed varies from 12 years to 70 years.

Section II. Interpretation of the Inner Nature of the Reaction.

In the present chapter it is the purpose of the author to prove that the biological phenomenon which constantly appears as formulated under the conditions described in preceding Section I, is:

A. The result of a biochemic reaction in virtue of which the iodine introduced into the blood connects with or acts primarily upon protein or other organic property of the blood or in tissue-elements previous to its connection with sodium (in the blood as bicarbonate) and elimination through (chiefly) the kidneys as iodide of sodium;

B. The result of a biochemic and dynamic process, in virtue of which the cause of the dysarteriotonia, symbolically designated as dysarteriogen, is neutralized or destroyed by a dysarteriogenolytic action of iodine under the conditions formulated in Section I;

C. The result of a biochemic and dynamic process, by virtue of which toxic influence in the blood or tissue-elements, briefly toxaemia, possessing dysarteriogenic action, is made to disappear through a toxilytic action of iodine, under the conditions formulated in Section I;

D. The result of a physiological process in virtue of which the radialis maximum tension reverts to the normal level, exceeding 140 m.m., not exceeding 150 m.m. Hg. through automatic readjustment of the vascular neurons to their normal state of coördination as soon as the toxaemia which caused the preëxisting anomaly has ceased to be effective.

Section III. Necessary Facts Observed, and Required for the Purpose of Substantiating the Interpretation of the Reaction.

1. The change from higher radialis maximum tension to the normal tension of 150 m.m. Hg., takes place within 2-6 hours in the vast majority of cases of hypertension referred to in the preceding Section I. In less numerous cases, probably less than 10%, it may require 1-2 weeks, or more, for the reaction to complete itself, and in exceptional cases the reaction is negative.

2. In cases belonging to the psychoneurological groups of morbidity, in which the radialis maximum tension is hypotonic, *i.e.*, of a basic value lower than 140 m.m. Hg. down to the lowest levels compatible with life—even if complicated with pulmonary tuberculosis. Such hypotension is increased to the normal value of 150 m.m. Hg., by the same process as referred to in preceding point 1. When in cases referred to in this point 2, the low radialis maximum tension values are increased to the normal tension of 150 m.m. Hg., the biological process is usually slower than when hypertension values are reduced to the normal level. It requires, in the majority of cases, 1-4 days for completion; —this occurs, usually, in cases complicated with pulmonary tuberculosis; in less numerous cases, 1-3 weeks, and only in exceptional cases, with prognosis pessima, the reaction is negative.

3. The biochemic reagent used for this reaction was discovered by the author, together

with the biological phenomenon described above, in the last months of 1908, and in the early months of 1909, and further developed in subsequent years.[20] The reaction was briefly described in a paper on the "Normal Arterial Tension," read by the author before the Boston Society of Psychiatry and Neurology (Jan. 17, 1919), and a description of the reagent was published in the Boston Medical and Surgical Journal March 13, 1919, in which article all necessary rules of proceeding are formulated.

4. If the biochemic reagent is mixed with a solution of bicarbonate of sodium before it is used (*i.e.*, iodine transformed into the state of iodide of sodium) the reaction will, in all cases, be negative.

5. If iodine is entirely excluded from the reagent, but all other constituents are retained in it, the reaction will be negative.

6. If a drop of the reagent is added to a mixture of guaiac tincture and peroxide of hydrogen, there will instantly develop deep blue coloration of the mixture and simultaneous liberation of oxygen.

7. If the reagent is in accord with rules (cnfr. Boston Medical and Surgical Journal, March 13, 1919), and given by mouth, but the patient immediately afterwards sets his articulations going in lively or violent motions, the reaction will be negative or imperfect.

Section IV. Deductions Supporting the Interpretation of the Biochemic Nature of the Reaction.

From the facts thus far mentioned, the following deductions are made:

A. The positive reaction is due to the action of iodine, which is proven by the facts stated in Section III, point 5.

B. The positive reaction is not due to action of iodide of sodium, which is proven by the facts stated in Section III, point 4.

C. The positive reaction is not due to a direct (first stage) connection of iodine with sodium (bicarbonate) in the blood, which is proven by the facts stated in Section III, point 4.

D. The positive reaction is not due to connection of iodine with any inorganic base or constituent in the blood, inasmuch as it is a physiological-chemical fact that the blood does not contain any inorganic hydroxyl replaceable by iodine other than as connected with bicarbonate of sodium, *i.e.*, does not contain OH replaceable by J, except as furnished by $NaHO_3CO$ through displacement of CO_2.

E. The positive reaction is due to direct connection with or primary action of iodine upon protein or other organic property in the blood or tissues (Compare [29]).

This conclusion is a correlary of the next preceding deductions, A, B, C, D, together with the physiological chemical fact of predominant amount of protein and other organic properties in the blood, and the conclusion is further strengthened by the fact of a predominant proteino-tropic affinity possessed by the biochemic reagent used, as stated in Section I and Section III, point 3; the conclusion is also strengthened by the positive reaction to combined, simultaneous catalase and oxidase test, as stated in Section III, point 6; the catalase and oxidase reaction to be discussed at future occasion, pending further development.

Section V. Deductions Supporting the Interpretation of the Dynamic Nature of the Reaction.

From the facts thus far mentioned, the following deductions elucidate the dynamic nature of the reaction:

A. Inasmuch as the arterial hypotension values, as mentioned in Section I and Section III, point 2, from 140 m.m. to 70 m.m. Hg., or lower values, are augmented to the normal values of 150 m.m. Hg., the action of iodine in this reaction is not, in physiological sense, a direct action of vasodilation or depressor action;

B. Inasmuch as the hypertension values, as mentioned in Section I and Section III, point 1, from 160-320 m.m., or more, are decremented to the normal level of 150 m.m. Hg., by the same reagent as augments the hypotension values mentioned, it follows that the action of iodine in this reaction is not, in physiological sense, a direct action of vasoconstriction or pressor action:

C. Inasmuch as the action of iodine in this reaction is neither pressor (constrictor) nor depressor (dilator), it can not be, in dynamic sense and in direct relation to the vasomotor-mechanism, organotropic, from which follows that it must be, in dynamic sense, aetiotropic, *i.e.*, it must produce its action upon the existing cause of the disturbance by removing the same, which is responsible for the preëxisting anomaly of the radialis maximum tension.

Section VI. Summary of the Biochemic and Dynamic Interpretation of the Reaction.

The line of arguments pursued above unto this point leaves the following result proven: the cause of the anomalous radialis maximum tension—hypo- as well as hypertension—in the cases under consideration, is removable by the action of iodine, if it is carried into the blood by a molecular complex possessing predominant affinity to colloidal protein, by connecting with or acting primarily upon protein or other organic property in the blood or tissues.

At this point the biological phenomenon under discussion is proven to possess the quality of a test for the differentiation of the cause of anomalous radialis maximum tension as being a removable influence or substance as contra distinct from causes which are not removable by biochemic reaction, such as arteriosclerosis, cardio-, or nephrosclerosis, or organic structural changes of any kind in the several organs related to the coördination and adaptability of the cardio-vascular neuromuscular mechanism.

Section VII. Conception in which the Preceding Results are Unified.

If at this point, for convenience of expression, the term of dysarteriogen is introduced into the discussion as designation for the unknown removable cause of the anomalous radialis maximum tension (dysarteriotonia), it stands proven by the facts and arguments presented above that iodine, under such conditions as described in this connection, possesses dysarteriogenolytic power in the sense that it makes the cause of dysarteriotonia in its various modalities to disappear, directly or indirectly, by neutralizing the cause in the blood or by destroying its genesis in the tissue-elements.

For the moment is then left out of consideration the particular nature of the dysarteriogenic influence which constitutes the cause of the anomaly of the radialis maximum tension and the term of dysarteriogen is used as in wide sense a verbal symbol of the unknown cause. Thus, the biological phenomenon observed by the author and here described, constitutes a biochemic dysarteriogenolytic reaction.

Section VIII. Arguments Proving Toxaemia to be the Cause of the Anomaly of Radialis Maximum Tension in the Cases under Consideration Here.

Inasmuch as, in several publications, the author has made the statement that toxaemia is the cause of dysarteriotonia, in the cases here considered, it remains for him to show his ground for identifying the cause-symbol spoken of as dysarteriogen with toxaemia. The author's presentation of proofs in support of this conclusion will now begin by arguing "per exclusionem," then continue by arguing "ab juvantibus," and thereafter be supplemented by reasoning "ex analogia," finally leaving the field open for "direct biochemic evidence."

A. Deduction "per exclusionem."

a. The fact that, as proven above, the cause of the anomaly of the radialis maximum tension is removable by a biochemic reaction, excludes the possibility of the anomaly in the cases under consideration being caused by arteriosclerosis, or other form of tissue degeneration, neoplasm or organic structural alteration of any kind, inasmuch as none of the latter is removable by biochemic reaction.

b. The fact that the cause of the anomaly of radialis maximum tension is removable in so very short a time, a few hours or a few days, excludes the possibility of this anomaly in the cases under consideration being due to inflammatory infiltrations as necessary cause, even though in certain groups of cases inflammatory processes evidently contribute to the persistence of the anomaly.

c. The fact that in pulmonary tuberculosis sputum continues to be bacilli-positive, even after normalization of the radialis maximum tension by the biochemic dysarteriogenolytic reaction, as observed by the author, proves that the presence of bacillus tuberculosis in the lungs and the consequent reactive processes in the lung tissue are not the cause of the anomaly of the radialis maximum tension in pulmonary tuberculosis, even though they may contribute to the persistent dysarteriotonia in certain cases.

Summary of deductions "per exclusionem": Organic structural changes in the tissue elements, including inflammatory infiltrations, *i.e.,* cellular pathological processes and also bacillus tuberculosis in the lungs, are excluded as necessary causes of the anomaly of radialis maximum tension in the cases under consideration, and their incidental presence is, in this connection, reduced to the significance of epiphenomenon.

Out of the clinical material observed, more than 100 cases have had normal body temperature during the whole period of observation. Only a small number of cases have been complicated by cardiac or renal disease. Therefore, infections and cardio-renal complications are excluded as necessary causes of the anomaly of radialis maximum tension.

By the above exclusions, the field of causal possibilities is narrowed down to toxic substances in the blood and tissues, exhaustion, intrapsychic processes, and afferent influences from the environment.

B. Deduction "ab juvantibus."

a. In certain groups of psychoneurological morbidity, particularly in the manic depressive disease of young persons, the author has frequently observed (cnfr. article, Boston Medical and Surgical Journal, March 6, 1917) that when remission in the phychotic symptoms begins, the radialis maximum tension simultaneously gets reduced spontaneously to the normal value of 150 m.m. Hg. from the high level tension which, with numerous oscillations, has persisted throughout the active state of the disease and that, thereafter, the radialis maximum tension remains continuously normal as long as the remission of psychic symptoms persists.

In presence of this experience, the interpretation might suggest itself that the psychotic symptoms may be the cause of the disturbance of the arterial tension and that cessation of the psychotic symptoms results in normal radialis maximum tension as effect. Against such interpretation as a mere conjecture, stands the following solid fact:

b. In manic depressive disease, not less than in other psychoses, even such in which spontaneous remissions do not occur, or are relatively rare, the author's biochemic dysarteriogenolytic reaction is positive within a few days or weeks (in some cases sooner). If, thereafter, the normal radialis maximum tension is sustained, there develops a gradually more quiet psychic symptom-picture, with marked improvement in adjustment to environment and, in an impressive number of instances, there develops remissions of psychic symptoms, or recovery.

c. In the presence of this last category of facts, the conclusion is in favor of toxigenous influence as cause of anomalous arterial tension and against psychogenous cause, whether autogenous or receptive-emissive. Two reasons determine the question.

First, the positive dysarteriogenolytic reaction to iodine precedes in time the remission of psychotic symptoms, usually by weeks in this class of cases, maybe by months.

Second, the positive dysarteriogenolytic reaction through iodine cannot, by any known or imaginable mechanism, be explained as produced by a direct primary action upon the psychic processes; influence upon the psychic processes by iodine can be conceived as produced only indirectly, as an ultimate result by intermediation of a primary modifying action upon the blood which feeds the tissue-units or "zones" in which the psychic processes have their substance locus.

A similar line of arguing may be formulated and substantiated so as to extend its validity to exclusion of even exhaustion and afferent neuronic influences through excitations from the environment as causes of dysarteriotonia in the cases here considered.

Summary: By the preceding arguments "per exclusionem" and "ab juvantibus," toxic influences, in a word, toxaemia, only remains as causal possibility in relation to the dysarteriotonia in the 250 cases presenting positive biochemic dysarteriogenolytic reaction, as observed by the author in the psychoneurological groups of morbidity and in pulmonary tuberculosis. Therefore, the induction is justified by facts, that toxic influences, in a word, toxaemia is operative as cause in all other cases of the same groups of morbidity, save a small percentage of exceptional cases or exceptional circumstances.

Thus, step by step, through a solid structure of evidence, the inductive result is reached that the author's biochemic dysarteriogenolytic reaction possesses the inner nature of a biochemic angio-kinetic toxilytic reaction.

Can further evidence be mobilized in support of this conclusion?

C. *Reasoning ex analogia.*

In medical logic, reasoning from analogy possesses less decisive force than other logical figures ordinarily used in scientific investigation. However, when superadded to inductive result based upon as large material of direct observations as has been presented in support of the deductions by which, on preceding pages toxaemia is established as cause of dysarteriotonia in the psychoneurological groups of morbidity and in pulmonary tuberculosis, reasoning from analogy cannot possibly be misleading. Conversely, it may possibly contribute to a further illumination of the pathogenetic relations of the toxaemia here considered. The experience of contemporary physiological chemistry and pharmacology regarding the action of iodine when present in organic connection with globulin, in thyroid gland, is not defined in relation to arterial tension, nor definable in arteriotonometric terms, as far as the author has observed hitherto. It is another and separate subject; but the thyroid iodine is known to possess an action in relation to various toxic substances, decreasing the toxicity of some of them, increasing the toxicity of others (Cnfr. Reid Hunter,[27] Olof Hammarsten[28] and other authors). In consequence, the thyroid iodine may be considered in some part aspect to offer relations more or less analogous to the author's conclusion in this article, proving an antagonism to toxic influence to be possessed by iodine when used with exactitude under such technical precautions, that it is made to connect with or primarily to act upon protein or other organic property in the blood or in the tissue units, and under the further condition that caustic action upon the tissue-elements by free iodine is excluded.

Toxaemia being proven to be the cause of the dysarteriotonia in the psychoneurological groups of morbidity and pulmonary tuberculosis, two questions remain to be answered, namely: what is the physiological explanation of the biochemic angio-kinetic toxaemia reaction, and which toxic substances are concerned in the toxaemia?

(To be continued.)

Current Literature Department.

ABSTRACTORS.

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Wassermann Test with Secretions, Transudates, and Exudates in Syphilis.

Kendall, J. V., and Kolmer, J. A. (*Jour. A. M. A.*, June 11, 1921) draw the following interesting conclusions from their work:

The Wassermann test was performed with milk, saliva, seminal fluid, exudates and transudates from syphilitics.

An antisheep hemolytic system, water bath incubation and a cholesterolized antigen were used in performing the test.

Wassermann tests with the heated serum of each patient were conducted with the same antigen and with the same technic. All yielded a positive reaction.

All specimens were first titrated for anticomplementary activity. Milk and saliva were found to be highly anticomplementary.

Nineteen specimens of milk were examined; positive Wassermann tests were obtained in three.

Twenty specimens of saliva were examined; a weakly positive Wassermann test was obtained in one.

Thirty specimens of seminal fluid were examined. A moderately positive Wassermann test was obtained in one.

Ten specimens of aqueous fluid from the anterior chamber of the eye were examined. All yielded a negative test excepting two in which the test was doubtful.

Eleven specimens of exudates and transudates were examined. All yielded a positive Wassermann test. The degree of positive Wassermann reaction closely paralleled the reaction obtained with the blood from the same patient.

Evidence is presented which supports the belief that the complement fixing antibody in spinal fluid is in all probability dual in origin, neutral as well as hematogenous.

The presence of the complement fixing antibodies in exudates and transudates from syphilitics is regarded as derived from the plasma of the blood.

The Wassermann test was performed with the surface fluid from a number of chancres, and with the saline extract of syphilitc nodules removed from the testicles of syphilized rabbits. All the tests performed with chancre fluids yielded almost uniformly ++++ reactions. The reaction performed with saline extract of syphilitic testicular nodules yielded positive results. The control reactions in both studies were negative.

These positive reactions support the belief that at the site of syphilitic lesions there may occur a local formation of complement fixing antibodies. The reaction in these circumstances is styled the "local" Wassermann test. The practical value of the "local" Wassermann test is pointed out as a possible aid in differentiating syphilitic from nonsyphilitic lesions particularly when applied to chancre fluid as a means to the early diagnosis of syphilis. [E. H. R.]

The Dangers of Pituitary Extract.

Rucker, M. P., and Haskell, C. C., (*Jour. A. M. A.*, May 21, 1921) make the following clinical and experimental observations:

The clinical evidence indicates that the use of pituitary extract is accompanied by danger to both the mother and the child. The dangers to the mother are increase in the frequency of lacerations and occasional occurrence of uterine rupture even in cases in which all the indications for the use of the extract are present.

The dangers to the child consist in the greater tendency toward the production of asphyxia and intracranial hemorrhage.

From the experimental evidence it is apparent that the circulatory action of the drug is undesirable and that it tends to cause tetanus of the uterus.

The authors do not wish to imply that the drug is always unsafe, but wish to point out its real danger and to warn against a feeling of entire ease when using is. [E. H. R.]

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THE SURGEON'S FEE.

The recent ruling promulgated by the trustees of the Johns Hopkins Hospital that no fee for an operation shall exceed one thousand dollars and no charge for after-care, in that hospital, shall be more than thirty-five dollars a week, has excited much comment in the New York daily press. New England is a modest community where thousand dollar fees are not as numerous as in the Metropolis. We have a large number of highly skilled surgeons to the square mile and some of them find that when they send a patient to a hospital for an operation the hospital charges for board and nursing, raised by the high cost of living, leave little for the surgeon's fee. Being trained to idealism and service to their fellow men, they are content, so long as the income is sufficient to keep the wolf from the door. They look with interest on the keener competition in the largest city of the country and wonder why the Hopkins feels the need of such rules.

The consensus of opinion among the surgeons of New York who were interviewed by the reporters seemed to be that the trustees of the Hopkins were trying to protect their patients from excessive charges by members of their staff, whereas the view was held very generally in New York that the action taken would result in a flocking of the very wealthy to Baltimore to obtain major operations at a smaller price than would have to be paid elsewhere. Patients who could well afford to pay $2500 to $5000 for the highest skill, would there get it for $1000. People of moderate means in a hospital for treatment, where such a rule obtained, would be more apt to be charged $1000 for an operation which, before the ruling, would have been done for $500; in other words, the $1000 fee would become more common, and furthermore, the maximum fee would be charged everywhere by the surgeons of inferior ability and training, if an attempt is made to standardize medical fees. Perish the suggestion of one surgeon interviewed, that a maximum fee would lead to the performance of only one operation at a sitting, where several were indicated, so that $1000 might be charged for each surgical procedure as it was finished. We are glad that man does not live in New England. His business sense is too highly developed for us.

The custom at the Mayo Clinic at Rochester, Minn., has much of fairness to commend it. There, the patient is charged for a major operation five per cent. of his income, considerable time and effort being expended in an effort to learn what the income is.

In our opinion, fees for surgical operations cannot be standardized with justice to all, and no rules will prevent profiteering. Fortunately, the number of those surgeons who would try to gain at the expense of their fellow men is relatively small.

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THE TRUTH ABOUT VIVISECTION.

Every physician who is willing to use influence in controverting the arguments of the anti-vivisectionists should read the article in the July number of the *Woman's Home Companion*, by Ernest Harold Baynes, under the title, "The Truth About Vivisection."

The author carefully and fully explains the quality of the medical opposition to vivisection and then goes on to show that the greatest medical organizations in the world approve of the proper employment of this method of study. The full explanation of the "Pavlov" dog is given in an interesting and convincing way. Mr. Baynes then shows the incalculable benefits which have come to the human race through knowledge acquired by animal experimentation, using as illustrations diphtheria, sepsis, typhoid, yellow fever, and last, the saving of Dr. Grenfell's life by the sacrifice of his three dogs.

Doctors, as a rule, do not combat false arguments designed to injure the standing of medical methods, because oftentimes facts are not available, and also because of lack of training in debate. A few facts properly presented at opportune times will do much to maintain the dignity and standard of medicine.

The following letter from Dr. Keene, another man in the trenches, is of pertinent interest, and at his suggestion the part referring to the "Pavlov" dog is presented:

The "Pavlov" Dog.

In another recent pamphlet put out by the anti-vivisectionists much is said about the Pavlov experiments, so called because a famous Russian physiologist of that name first performed them, with a view to obtaining pure gastric juice; that is, gastric juice unmixed with the food taken into the stomach. In the pamphlet the feelings of the reader are harrowed by a revolting description of the sad plight of dogs doomed to supply this gastric juice.

Now, speaking very briefly, the chief operation involved consists of dividing the stomach into two parts, a large part and a small part, separated from each other by a double layer of mucous membrane. In the large part digestion goes on just as it did before the operation. The small part, known as the Pavlov pouch, has a little hole in one end, and the edge of this is attached to the edge of a small opening of the same size in the abdomen. The wound heals quickly, and there is no more discomfort than one has from a natural opening—the mouth or nostrils, for example. The Pavlov pouch being separated from the rest of the stomach, no food can enter it. But, interestingly enough, when the dog eats his food—just as other dogs do, by the way—gastric juice is secreted, not only in the stomach itself, but in the little pouch which was once a part of the stomach. From this it is allowed to trickle into a cup or jar, and pure gastric juice is obtained.

A few weeks ago I was in the Physiological Laboratory of Chicago University, and I was looking for the room of a professor with whom I had an appointment. Presently my attention was attracted to a door by the sounds of scuffling feet, the laughter of several men and, above all, the joyous barking of a dog. I opened the door and there were several doctors, playing with a little yellow dog with a broad white bandage around her middle in the form of a belt. They were romping with her and she was thoroughly enjoying herself. The doctors later introduced her to me as "Buster—a member of the staff." This is a "Pavlov" dog, and, as I wrote to Mrs. Baynes, "It is one of the happiest, best cared-for little dogs I have ever seen." The original operation was performed under ether eight years ago.

Dr. Keene's Letter.

Mr. Editor:—

In the *Woman's Home Companion* (N. Y.) for July is one of the best articles I have ever seen, "The Truth about Vivisection," by Ernest Harold Baynes (Meriden, N. H.). By all means get a copy and reprint parts of it, especially that about the Pavlov dog: that is wholly new. Mr. B. is the most widely known and esteemed friend of animals in the U. S. He became a convert to experimental research by careful investigation of the literature on both sides and by visiting all the chief experimental laboratories in the U. S. His words count for ten times what mine would, because of his well known efforts to aid animals in every way. He is the founder of the first and father of all the later Bird Refuges; was the inspirer of the pageant, "The Bird Sanctuary" by Percy MacKaye, which was produced at the very first bird refuge in the U. S. at his home in Meriden, N. H.

He is a professional lecturer on wild life, bird life, nature study, etc. He has already suffered for his fidelity to his convictions, for as soon as his paper alluded to was published, a $400 engagement was cancelled. Miss Lane, the editor of the *Woman's Home Companion*, has been deluged with "letters" the moment the number of the journal was put on the market, and subscriptions were cancelled.

We owe it to her and to Mr. B. to aid them by urging subscriptions to her journal and by getting appointments for Mr. Baynes' lectures. He is preparing a new lecture on vivisection, with many original lantern slides which will be very convincing. This we ought especially to push as a part of our own propaganda. I hope you will urge this editorially.

Pardon this long letter; but I am deeply interested in helping Miss L. and Mr. B., for they have done a fine and thoroughly unselfish service.

Yours truly,

W. W. Keene.

CANCER WORK.

The American Society for the Control of Cancer has announced plans for a campaign under an organization composed of a local committee for every five thousand population or more in each state, under the guidance of a State Chairman.

The aim of this campaign is educational under three lines of effort: (1) Lectures for professional groups, such as medical societies, nursing organizations and also those for the general public; (2) Literature: to be distributed at meetings and otherwise as may be determined by the local committee. This literature can be secured at cost; the circular, "Vital Facts About Cancer," for example, is quoted at $20 per five thousand, or $35 per ten thousand; (3) Publicity: This falls under two main headings,—articles in professional journals and those in the lay press. The profession and trained newspaper men are asked to coöperate. In order to make the campaign uniform, the local chairmen are asked to follow certain details as defined by the national organization. The campaign should emphasize the facts that (1) 85,000 people die yearly from cancer in the United States, and (2) that the majority of cases could be cured if taken early.

Health Departments are urged to provide a lecture staff, issue a special bulletin, and take an active part in arrangements for, and conduct of public hearings. In larger centers, cancer exhibits should be provided. Medical societies should be asked to hold one meeting during cancer week for a consideration of the subject from a professional standpoint, and arrange for a public meeting. Medical schools and nurses' training schools are also asked to coöperate, as well as public health nursing organizations.

Schools for health officers, insurance companies and women's clubs should also be invited to assist; indeed, all social and business organizations will be enlisted.

The work is to be condensed into the week of October 30 to November 5.

For further information, apply to The National Headquarters, 25 West 45th Street, New York City.

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MEDICAL NOTES.

Legal Liability for Transmitting Infection.—Personal responsibility for the transmission of venereal diseases has now been upheld in several different phases by both civil and criminal courts, says the U. S. Public Health Service. In Oklahoma, a man has been sentenced to five years in the penitentiary for infecting a girl with syphilis. In Nebraska, the court upheld a doctor who warned a hotel keeper that one of his patients, a guest at the hotel, had syphilis, and had refused treatment, and was consequently a menace to the public health. In North Carolina, a woman has been awarded $10,000 damages against her husband for a similar infection and the Supreme Court has upheld the judgment.

The Nebraska case is important because it asserts that a physician's duty to protect the public health may, under certain circumstances, transcend his duty to hold his patient's confidence inviolable. The North Carolina case is also important because it sets aside, in this particular case, the legal barrier that prevents a wife from testifying against her husband and bringing suit against him.

All three cases are valuable in counteracting incorrect statements, often made, that the venereal disease law falls almost exclusively on women and lets men go free. State laws, of course, govern in all such cases, but the fact that every state in the Union has now adopted many if not all of the venereal disease laws, gives ground for expecting similar action in other states. Certainly the wide dissemination of the three decisions should go far to curb diseased persons who deliberately expose others to infection.

Curiously enough, the District of Columbia is the only part of continental United States that has no venereal disease laws. Congress, which makes the laws for the District, has not yet acted.

The fact that the North Carolina decision makes it likely that marriage will henceforth be no adequate defense against a suit for transmitting infection will probably hasten the adoption, by the states, of laws requiring every applicant for a marriage license to present a certificate by a reputable doctor certifying that he is free from venereal disease and providing that without this, no license shall be issued.

Twenty states have already adopted laws forbidding persons with venereal disease to marry, seven of these—New Hampshire, New Jersey, North Carolina, Oregon, Washington, and West Virginia—having acted during the present year's sessions. A similar bill is now pending in Florida.

All of the twenty states do not require medical examination and certification that the applicant is free from venereal disease. "Such a certificate should be required in every state," insists the Public Health Service. "Any decent man with an uncured infection who marries does so either because he does not realize the seriousness of his action or because he believes that he is cured. The necessity for an examination should bring its seriousness home to him and should be welcomed by him as a protection for his wife and children. No real man should object to a medical examination required by law.—*Bulletin Department of Health,* New York.

Doctors Park and Zingher of the New York City Department of Health, have tested over 52,000 children in forty-four schools of Manhattan and Bronx during the late winter and spring of 1921. Some of their conclusions on Schick testing and active immunization which these many tests have disclosed are as follows:

1. Children from the homes of well-to-do have a higher percentage of positive Schick reactions than do children of poorer groups of the population living in closely crowded neighborhoods.

2. "Contact immunity" seems to be an important element in the establishment of so-called "natural immunity." Repeated exposure to the diphtheria bacillus in the congested districts seems to cause not only actual clinical cases of diphtheria, but also may produce mild infections of the mucous membranes which are not recognized as diphtheric, but which may lead to the gradual development of antitoxic immunity.

3. There seems to be a racial factor in immunity to diphtheria. Negro children living in crowded neighborhoods show a high proportion of positive Schick reactions. Children of Italian extraction, living in the crowded East Harlem section, gave the lowest percentage of positive reacions. Jewish children also living in congested sections of the city showed a low, and children living in the less crowded areas, a high percentage of positive reactions.

4. There seems to be a "family factor." There was a marked tendency for all the children of a given family to show the same Schick reaction. Where exceptions to this rule were found, the younger children usually gave a positive and the older children a negative reaction. Again, different families living under closely parallel conditions would often show entirely different Schick reactions. With regard to capacity for antitoxin production, there is probably an hereditary tendency on the part of the children of a family to respond either

readily or slowly and poorly, to repeated mild infections with the diphtheria bacillus.

5. Children once reacting negatively to the Schick test continue their immunity for considerable periods of time.

6. Natural antitoxin immunity in human beings, therefore, can be interpreted as due to a combination of factors in which contact immunization seems to play the most important part. The racial and hereditary factors, however, must also be considered.

7. Schick-positive children who have received toxin-antitoxin treatment should not be certified as immunes until a retest has been made.

The experience of Doctors Park and Zhinger appears to indicate that, for the present, at least, it will be a better procedure to continue to give the Schick test in conjunction with the prophylactic treatment, rather than to give the prophylactic treatment alone, as has been done in some cities. Otherwise, large numbers of children, especially the "combined" reactors, will show severe reactions, and in this way, the good will of the parents, of family physicians and of the children themselves may be lost.—*Statistical Bulletin, Metropolitan Life Insurance Company.*

Dr. Perley P. Comey of Augusta, Georgia, formerly of Clinton, Mass., later of Worcester, and a former president of the Worcester District Medical Society, has opened an office in Worcester for the months of July, August and September.

General Jan Smuts:—"There are only two ways in the world—the way of force and the way of understanding. We have probed the way of force to the uttermost. We have seen it reduce the world to a mass of ruins. The way of force has been explored to the uttermost, and we have today the result of that exploration written large on the face of civilization. There is only left us this way of understanding, of conference, of friendship and coöperation between nations."

Standard Tuberculosis Sanitariums.—From data collected from every available source, the U. S. Public Health Service has prepared and published plans and specifications for a model sanitarium for tuberculosis patients, especially those from the World War. Where possible, these plans will be followed in future service hospital construction; and where conditions will not allow exact adherence they will be used so far as possible.

Making National Parks Safe for Democracy.—A concerted effort is being made by the U. S. Public Health Service and the National Park Service, to make the National Parks of the United States safe and sanitary for the vast numbers of Americans who have recently taken to touring them. Before the war, when tourists were fewer and most of them travelled on stage lines and stayed at park hotels, the sanitary problem was simple. Since the war, however, the great majority travel in automobiles and camp out, enormously complicating all health matters. The work consists in examination and protection of water supplies, disposal of garbage and sewage, inspection of milk and food and the way they are handled; providing for camp policing and sanitation; and prevention of malaria. Malaria-carrying mosquitoes have been found in Yosemite Park; and especial efforts will be made to eradicate them there and to prevent them from "acquiring a residence" in other parks.

Rats and the Plague.—Rat extermination and resulting removal of danger from bubonic plague is being pushed by the U. S. Public Health Service. Portland, Maine, and Baltimore, Md., among other cities, have made appropriations for the work, in which the Public Health Service will coöperate. The extreme difficulty of eradicating the plague, which is essentially a rat and not a human disease, when once it gets a foothold, makes rat-proofing of houses of the very greatest importance. This is especially true in sea-coast cities, where even the very greatest precautions cannot always prevent rats from getting ashore from vessels coming from ports where the plague is endemic.

Among the twenty large cities of the United States, Boston has the largest death rate with one exception, for the year 1920, being 15.44 per one thousand people, the lowest death rate being 10.18 in St. Paul.

The mortality among children under one year of age per 1000 births was 102, this being exceeded by only one city, Pittsburgh, with a number of 110. New York only lost 85.

Even with our many organizations there is room for improvement. There is no apparent reason why the death rate of infants should be so high here.

The annual report of the Medical Department of the United Fruit Company has interesting articles on some of the diseases met with among the people employed, or dealt with by this company. As usual, evidence is presented that vaccination controls smallpox. There are descriptions of alastrim and Kaffir pox, which have been mistaken for smallpox.

Captain Paul H. Hines, representative from the 10th Suffolk District, is urging a modification of the regulations of the Boston Board of Health, which requires that milk shall be distributed by the bottle. He points out that bulk sale is permitted in New York City, and contends that under the same conditions, milk can be delivered in Boston for ten cents per quart and that distribution by use of cans which can be emptied by a faucet will insure freedom from contamination. The better infant mortality in New York City as compared with Boston, is used also as an argument.

Obituaries.

JAMES MONROE FAY, M.D.

Dr. James M. Fay died at the Dickinson Hospital in Northampton, of which he had been a visiting physician for over twenty years, on July 26, 1921, aged 78 years. He was born in Chester, Mass., March 23, 1842, going to school in Middlefield and Chester and at Wilbraham Academy, studying medicine in the last place with his maternal uncle, Dr. Orton Bell, who was descended from a long line of physicians. His further medical education was obtained at the University of Vermont, where he received his M.D. in 1875, in that year taking fellowship in the Massachusetts Medical Society and settling in Chester. There he remained until 1879, when he took post-graduate courses at the New York College of Physicians and Surgeons. Starting practice again in Haydenville in 1881, he stayed until 1886 when he moved to Northampton for the rest of his life. He married Miss Harriet Forsythe of Williamsburg in 1871; she dying in 1886, he married, the following year, Miss Louise Hubbard of Hatfield. She died in 1903, and he made a third marriage in 1905, being united to Miss Clara M. Cate of Wyoming, N. Y., who survives him.

In the early days of his practice in Northampton, Dr. Fay served as chairman of the Board of Health and as city physician. In 1887, he became visiting physician to the Dickinson Hospital; after a service of twenty years, being made a trustee and filling that position until his death. In politics, Dr. Fay was a Republican; he represented his district in the Legislature in 1892 and twice ran for mayor of the city. He was a Mason, a Pythian, Odd Fellow, Knight Templar and Shriner, a member of the Sons of the American Revolution, of the Hampshire County Medical Association, to which he contributed several papers, and of the Eastern Hampden Medical Association. He was of a sociable, genial disposition and was much beloved by a large circle of patients and friends. Besides his widow, he leaves three daughters.

FLORENCE HALE ABBOT, M.D.

Dr. Florence Hale Abbot died at the New England Deaconess Hospital, Boston, August 1, 1921. She was born in Wilton, N. H., October 20, 1867, the daughter of Harris and Caroline Ann Greley Abbot. Her education was received at Pembroke (N. H.) Academy, at Cushing Academy at Ashburnham, Mass., and at Smith College, where she received a B. L. degree in 1891. Her medical degree was from the Woman's Medical College of the New York Infirmary for Women and Children, in 1897. Dr. Abbot served as assistant physician in three state hospitals for the insane in Massachusetts, from 1908 to 1910. From the latter date until about five years ago she had been an assistant at the private hospital, in Newton, of Dr. Edward Mellus. Since then she had been at the Boston State Hospital at Mattapan.

She was a member of the American Medical Association, Massachusetts Medical Society, New England Society of Psychiatry, American Medico-Psychological Association, Association of Collegiate Alumnae and the College Club of Boston.

Miscellany.

ARTIFICIAL LIMBS WORK AT ROEHAMPTON, 1915—1921.

On the sixth anniversary of the opening of these hospitals (June 28th, 1921), the Committee desire to acquaint those who have so generously supported the Institutions with the work that has been accomplished thereat and to convey some idea of what is to be their future.

Thanks to a world-wide response to the public appeal which was made in 1915 to provide an Institution for the supply and repair of artificial appliances for Officers, Warrant Officers, Non-Commissioned Officers and men who suffered amputation as the result of wounds received in the war, Queen Mary's Auxiliary Hospitals at Roehampton House and Dover House were opened.

In 1915 it was not realized that during the next four years approximately 41,000 men would need artificial legs and arms, but that has been the result of the war, as the following figures will show:

Officers		
Leg amputations*	1,500	
Arm amputations	550	
		2,050
Warrant Officers, N.C.O.'s and Men		
Leg amputations*	28,000	
Arm amputations	11,000	
		39,000
Total		41,050

* Approximately.

Roehampton House was opened on June 28th, 1915, with 25 beds, and has since been added to as follows:

October, 1915	224 beds
June, 1916	550 "
June, 1918	900 "

Although other centres in the United Kingdom for the supply, renewal and repair of artificial limbs have been organized by the Ministry of Pensions, the following statistics show that Roehampton has dealt with the major portion of the cases:

Number of New Patients who have passed through the Hospital since June, 1915.	
Officers	1,324
Warrant Officers, N.C.O.'s and Men	21,339
Number of cases Re-admitted for second limbs and repairs since June, 1915	
Officers	899
Warrant Officers, N.C.O.'s and Men	
Total	55,707

In addition a large number of cases have been dealt with through the post (Officers and Men sending their limbs for repairs). Since January, 1918, 16,518 cases have been so dealt with.

In 1916 Instructional Workshops and an Employment Bureau were opened in connection with the Institution, and the following figures will show how greatly they justified their existence:

Number of men who received training in various Trades and Commercial Classes	8,453
Number of men for whom employment was actually found by the Bureau on discharge from Hospital	4,987
Number of men for whom arrangements were made by the Employment Bureau for training in various trades after discharge from Hospital	4,166

The Instructional Workshops are now closed as, happily, most of these disabled men have found suitable employment.

In 1918, arm instruction classes were organized where officers and men were taught to use their mechanical appliances, and thanks to these classes, a large number of those who had hitherto found artificial arms merely an encumbrance were enabled to use them with efficiency and comfort.

The in-patient accommodation at Roehampton House has now been reduced to 200 beds, and these are kept fully occupied. The Out-Patient Department is a very busy one, frequently 50 to 60 men per diem attending for either major or minor repairs to their limbs.

Dover House (adjoining Roehampton House), which was so kindly lent by Mr. J. Pierpont Morgan and recently by the London County Council for the use of Officers, is now closed, as the Dover House Estate has been acquired for building purposes. Arrangements have been made for the accommodation of Officers who desire to attend Roehampton for the repair or renewal of their artificial limbs at the Officers Residential Club, North House, Putney Hill. There will, therefore, be no interruption in the work.

The Committee desire to express their sincere thanks to all those who have so generously supported the Hospitals by donations and the endowment of beds. It is hoped that this support may continue so that 200 beds may be permanently endowed and the Committee may be able, with the help of the capitation grant received from the Government, to maintain the Institution in its present high state of efficiency.

Francis Lloyd, *Chairman.*

THE NEW ENGLAND SURGICAL SOCIETY.

The New England Surgical Society will meet in Worcester, Massachusetts, September 21 and 22, 1921.

In addition to the President's address, papers will be read under the following titles:

1. Dr. Charles Mixter of Boston: "Surgical Aspects of Intra-abdominal Tuberculosis in Infancy and Childhood."
2. Dr. James S. Stone of Boston: "Intussusception—Clinical Manifestations."
3. Dr. Frederic V. Hussey of Providence: "Acute Intussusception—Surgical Treatment and Report of Cases."
4. Dr. Daniel P. O'Brien of New Bedford, Mass.: "Local Anesthesia Plus Drug Narcosis in Major Surgery."
5. Dr. John De J. Pemberton of the Mayo Clinic (guest): "The Goitre Problem."
6. Dr. J. H. Means of Boston (guest): "The Application of the Studies of Metabolism in Practice."
7. Dr. John M. Birnie of Springfield, Mass.: "Caesarean Section."
8. Dr. John H. Cunningham of Boston: The Treatment of Carcinoma of the Prostate." Will show lantern slides.
9. Dr. J. Dellinger Barney of Boston: "Recurrent Renal Calculi." With lantern slides.
10. Dr. Arthur H. Crosbie of Boston: "Observations on Some Unusual Kidney Conditions."
11. Dr. Ralph French of Fall River, Mass.: "Diverticulitis."
12. Dr. D. F. Jones of Boston: "Acute Pancreatitis."
13. Dr. John T. Bottomley of Boston: "Infections of the Biliary Passages."
14. Dr. Franklin W. White of Boston (guest): "The Value of Medical Biliary Drainage for Diagnosis and Treatment of Diseases of the Gall-Bladder and Bile Ducts."
15. Dr. Henry C. Tinkham of Burlington, Vt: Artero-mesenteric Obstruction of the Duodenum."
16. Dr. Edward R. Lampson of Hartford, Conn.: "Gastrojejunal Ulcers."
17. Dr. David Cheever of Boston: "The Physiological and Pathological Basis for the Surgical Treatment of Chronic Gastric and Duodenal Ulcer."
18. Dr. Jason Mixter of Boston: "Lesions of the Spinal Cord and Results after Operative Treatment."

19. Dr. George C. Wilkins of Manchester, N. H.: "Experiences with the Use of Radium."
20. Dr. Frank Lahey of Boston: Title to be announced later.

The dinner will be an important feature of the meeting.

Correspondence.

THE AVARICIOUS MEDICAL STUDENT.

Carney Hospital, South Boston, Mass.,
July 30, 1921.

Editor,
THE BOSTON MEDICAL AND SURGICAL JOURNAL,
Boston, Massachusetts.

Dear Sir:—

I have read with much interest in the issue of the JOURNAL of July 28, the editorial, "The Avaricious Medical Student." The arraignment of the medical student therein is severe, and it is a question whether the student is deserving of the label "grafter."

To those of us who were medical students during the war there has been much that has never been understood or even explained by the War Department, nor do we know the motives of its chief officers in formulating legislation and general orders for this particular class of students. However, we do know that we were in service—potential, at least, if not actual—and those of us who were actually in uniform or in barracks, know we saw actual service.

To my knowledge, many medical students in the Medical Enlisted Reserve Corps were in barracks or in service and, while in such service, were given physical examinations and the routine examinations necessary for discharge from the army. Surely, there was a general order from the War Department, calling these men into service—and why, if a few received such orders, was not this order applicable to all?

Not only were some of the Medical Enlisted Reserves ordered to report into barracks, but they also received the regular army issue of uniforms, etc. It is rather strange to find some of the Medical Enlisted Reserve under orders, and the others not subject to the same. Again, in order to be discharged from the Army was it not necessary to receive orders to report for physical examination, etc., in order to receive a discharge, and would not this order, even for a day, constitute service as much as the drafted man who arrived at the cantonment for only a day's service, and received a bonus under our Massachusetts Bonus Bill?

There have been many irregularities, omissions and commissions by the War Department, but why hold the medical student responsible for these, and is it easier to attack the student than the War Department?

It is a well known fact that medical students under the first and second draft bills were given special classification and were exempted from active service while in this class. The slogan was: "Do not let us follow England's example and send the medical students into the lines and leave the country without doctors." Those who created and made possible this exemption were impressed with the seriousness of this situation.

And now the medical Student is accused of graft! And he never saw active service! How did he get a discharge without reporting for examination to get out of service, the same as he was examined to go in? If not physically fit he would not have been accepted. And the Medical Enlisted Reserve, what did he give? As one who served in the Student Army Training Corps (perhaps another group of grafters), it was my observation that the medical enlisted reserve man saved the federal government at least many thousands of dollars for his tuition, board, room, laundry, etc., for which he received no government compensation, yet the member of the student army received all this, though he bought his own textbooks, supplies, etc. Again, if he desired to go into active service he could not, he would not be taken, he woud have to remain in the reserves, and we know that many students tried to go into active service. Especially is this true of those who tried to enlist in the Navy.

There was considerable feeling between the two groups of medical students—those of the S. A. T. C. and those of the M. E. R. C.—for the man in the Student Army was envious of the man in the Reserve Corps because the reserve corps man could have his freedom and study at home, away from the noise and confusion of the barracks, and the effort to keep his standing in medical school was thereby considerably lessened. He did not participate in the duties of "kitchen police" or "barracks police" and thereby lose his daily attendance—a pleasure which may have been compensated by the fact that he was paying his own expenses and, as a concequence, was at least entitled to this much freedom or "graft."

When the state bonus bill was given a hearing before the joint committees of the Senate and House of Representatives I, personally, represented the students from one of the medical schools of this state, and when it seemed that the members of the Student Army were to be excluded from the privileges of the bill, I strongly opposed their exclusion. It had been my privilege to serve the Commonwealth as a commissioned officer during the influenza epidemic, in the Massachusetts State Guard, resigning my commission to be inducted into the S. A. T. C., despite the fact my being a medical student gave me exemption, and after I had been in the Student Army and could form my personal conclusions of the same, immediately requested my transfer to active service—which was not permitted. Like the Medical Enlisted Reserve, I was in and could not get out.

On a summary of these facts and with the knowledge that the educators and the medical organizations and medical profession made possible these groups, and that the men in them were subject to army discipline—potential if not actual—it resolves itself into only one question: was the man in the Medical Enlisted Reserve Corps, with an army discharge paper, in the service, and was that service actual? Some had actual service and others may not have had, and how does the War Department account for this? Surely the student cannot answer for the War Department.

Until the War Department informs the State Treasurer upon these points the medical student can still contend he was in active service, and until such an answer is given, the student can honestly retain his bonus. "Grafters" is a hard term. We have heard it applied to the medical schools that had Student Army units—yet we cannot confirm this accusation.

I trust this letter will receive as much publicity as did your editorial, if only in justice to those who were in the Medical Enlisted Reserves in actual service and whom we know were there, yet cannot understand why they were in service and all the Medical Enlisted Reserves were not. Perhaps the War Department put something over on a few and not all.

Very sincerely yours,
DAVID HOWARD GIBSON, M.D.

[The JOURNAL is pleased to publish the criticism of the editorial referred to above. The attitude of the JOURNAL was based on facts and those facts are matters of record. If one person's reaction to these facts differs from that of another, the matter must rest as an expression of opinion. Opinions are always open to criticism. The editor is willing to be judged by the editorial and the criticism.—W. P. B.]